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## **Optical and Magneto-Optical Study of Orbital and Spin Ordering Transitions in $\text{YVO}_3$**

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Optical and magneto-optical properties of  $\text{YVO}_3$  single crystals have been studied in IR, visible, and UV regions. Below 74 K we have observed a large Kerr rotation, comparable to those in ferromagnets. This observation introduces a new class of materials: insulating antiferromagnets with strong magneto-optical Kerr effect, which can have advantages for practical applications. We look into the details of electronic and crystal structure changes.  $\text{YVO}_3$  was found to undergo two structural phase transitions. Initially the orthorhombic Pbnm symmetry is lowered below a second order phase transition at 200 K and recovers below 74 K at a first order phase transition. Two Mott-Hubbard (MH) bands dominate the electronic spectrum in the visible range, followed by charge-transfer gap in UV. Below the 200 K a transfer of the spectral weight to higher frequencies occurs and a third MH band appears at 3 eV. We discuss the results on the basis of spin and orbital ordering theory, proposed for  $\text{YVO}_3$ .